



25 October 2013

Michael Schlicher, PhD, RN, LTC, AN, USA  
Executive Director  
TriService Nursing Research Program  
Uniformed Services University of the Health Sciences  
4301 Jones Bridge Road  
Bethesda, MD 20814

RE: HU0001-10-1-TS09 (N10-P14) "Understanding and Improving Modifiable Cardiovascular Risks Within the Air Force", Principal Investigator, LtCol. Jennifer Hatzfeld.

Dear LTC Schlicher:

Attached please find the Final Report for the above mentioned study. LtCol Hatzfeld's Final Report covers from 1 September 2010 thru 30 June 2013.

If you have any questions please contact me at 253.682.3818 or e-mail at [krobinson@genevaUSA.org](mailto:krobinson@genevaUSA.org).

Kind regards,

Kathy Robinson  
Grants and Contracts Manager

<b>Report Documentation Page</b>		<i>Form Approved OMB No. 0704-0188</i>
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## 14. ABSTRACT

**Purpose:** The purpose of this study was to describe factors that influence the lifestyle health behaviors among active duty members in the U.S. Air Force and develop a lifestyle behavioral intervention. **Design:** A qualitative descriptive design was used. **Methods:** Participants volunteered to complete a one-hour interview. After the interviews were analyzed, the findings were used to identify important elements of a lifestyle modification intervention. These elements were reviewed by focus group participants for further refinement to the intervention. **Sample:** A total of 24 active duty members were enrolled into the study. Participants were purposefully sampled to achieve heterogeneity and variation in the presence or absence of a chronic disease (hypertension), race/ethnicity, officer or enlisted status, and age. **Analysis:** Each interview was coded by two members of the research team and consensus was achieved. Conventional content analysis was used to arrange the data into data-driven themes. These themes were then compared to the elements of the Health Promotion Model (HPM). **Findings:** The definition of health included exercise, proper eating, sleep, and a spiritual connection, as well as the absence of smoking, stress, alcohol, and caffeine; the fitness test was viewed as a career requirement, but not a measure of health. Three major factors contributed to health behaviors, including what it takes to be healthy, knowing oneself, and existing Air Force policies. The HPM did not fully address all of the factors that were found to influence health behaviors. An intervention to incorporate the basic tenets of healthy living with a personal application and incorporating Air Force-specific terminology was developed based on these findings. **Implications for Military Nursing:** Military nurses are uniquely qualified to ensure active duty members integrate their own personal history with a foundational knowledge of health behaviors and military requirements to develop and sustain a healthy lifestyle.

## 15. SUBJECT TERMS

**lifestyle health behaviors, lifestyle behavioral intervention, Force Health Protection**

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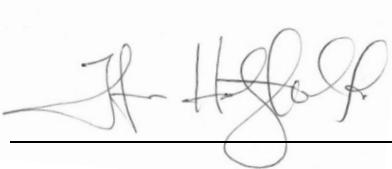
**Principal Investigator (PI) Military Contact Information**

Rank	Lt Col
Duty Title	Portfolio Manager, En Route Care Research
Address	722 Doughten St Ft Detrick, MD 21702
Telephone	301-619-0236
Mobile Telephone	4710.861.7556
E-mail Address	jennifer.j.hatzfeld.mil@mail.mil

**PI Home Contact Information**

Address	[REDACTED]
Telephone	[REDACTED]
Mobile Telephone	[REDACTED]
E-mail Address	[REDACTED]

**Signatures**

PI Signature		Date	Oct 28, 2013
Mentor Signature		Date	Oct. 28, 2013

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### Abstract

**Purpose:** The purpose of this study was to describe factors that influence the lifestyle health behaviors among active duty members in the U.S. Air Force and develop a lifestyle behavioral intervention.

**Design:** A qualitative descriptive design was used.

**Methods:** Participants volunteered to complete a one-hour interview. After the interviews were analyzed, the findings were used to identify important elements of a lifestyle modification intervention. These elements were reviewed by focus group participants for further refinement to the intervention.

**Sample:** A total of 24 active duty members were enrolled into the study. Participants were purposefully sampled to achieve heterogeneity and variation in the presence or absence of a chronic disease (hypertension), race/ethnicity, officer or enlisted status, and age.

**Analysis:** Each interview was coded by two members of the research team and consensus was achieved. Conventional content analysis was used to arrange the data into data-driven themes. These themes were then compared to the elements of the Health Promotion Model (HPM).

**Findings:** The definition of health included exercise, proper eating, sleep, and a spiritual connection, as well as the absence of smoking, stress, alcohol, and caffeine; the fitness test was viewed as a career requirement, but not a measure of health. Three major factors contributed to health behaviors, including “what it takes to be healthy”, “knowing oneself”, and existing Air Force policies. The HPM did not fully address all of the factors that were found to influence health behaviors. An intervention to incorporate the basic tenets of healthy living with a personal application and incorporating Air Force-specific terminology was developed based on these findings.

**Implications for Military Nursing:** Military nurses are uniquely qualified to ensure active duty members integrate their own personal history with a foundational knowledge of health behaviors and military requirements to develop and sustain a healthy lifestyle.

**TSNRP Research Priorities that Study or Project Addresses****Primary Priority**

Force Health Protection:	<input checked="" type="checkbox"/> Fit and ready force <input type="checkbox"/> Deploy with and care for the warrior <input type="checkbox"/> Care for all entrusted to our care
Nursing Competencies and Practice:	<input type="checkbox"/> Patient outcomes <input type="checkbox"/> Quality and safety <input type="checkbox"/> Translate research into practice/evidence-based practice <input type="checkbox"/> Clinical excellence <input type="checkbox"/> Knowledge management <input type="checkbox"/> Education and training
Leadership, Ethics, and Mentoring:	<input type="checkbox"/> Health policy <input type="checkbox"/> Recruitment and retention <input type="checkbox"/> Preparing tomorrow's leaders <input type="checkbox"/> Care of the caregiver
Other:	<input type="checkbox"/>

**Secondary Priority**

Force Health Protection:	<input type="checkbox"/> Fit and ready force <input checked="" type="checkbox"/> Deploy with and care for the warrior <input type="checkbox"/> Care for all entrusted to our care
Nursing Competencies and Practice:	<input type="checkbox"/> Patient outcomes <input type="checkbox"/> Quality and safety <input type="checkbox"/> Translate research into practice/evidence-based practice <input type="checkbox"/> Clinical excellence <input type="checkbox"/> Knowledge management <input type="checkbox"/> Education and training
Leadership, Ethics, and Mentoring:	<input type="checkbox"/> Health policy <input type="checkbox"/> Recruitment and retention <input type="checkbox"/> Preparing tomorrow's leaders <input type="checkbox"/> Care of the caregiver
Other:	<input type="checkbox"/>

### **Progress Towards Achievement of Specific Aims of the Study or Project**

#### **Findings related to each specific aim, research or study questions, and/or hypothesis:**

Aim 1: Identify predisposing, reinforcing, and challenging factors that influence the lifestyle health behaviors of active duty military members in the USAF.

A total of 24 interviews were conducted, audio recorded and transcribed as outlined in the proposal. As seen by the demographics in Table 1, participants were deliberately heterogeneous, particularly with respect to race, age, rank, and hypertension status. Although military members of officer rank under the age of 35 with hypertension were to be enrolled, it was found that this was an extremely small portion of the population (according to the population health office, only three officers under the age of 35 with a diagnosis of hypertension, were stationed at Travis AFB) so that cell was not filled.

	(N=24)
Race	
Caucasian	7 (29%)
Black/African American	7 (29%)
Other	10 (42%)
Age	
31-35	12 (50%)
Over 35	12 (50%)
Rank	
Enlisted	14 (58%)
Officer	10 (42%)
Hypertension Status	
Hypertensive	9 (38%)
Not Hypertensive	15 (63%)
Sex	
Male	14 (58%)
Female	10 (42%)

Table 1: Demographics of participants (N=24)

Initial coding was completed by two of the study team members (Lt Col Hatzfeld and Dr. Jennings) while Lt Col Hatzfeld was deployed to Afghanistan. The codes and themes were then reviewed and coordinated with the remaining team members to finalize the factors that influenced health behaviors among Active Duty Air Force Members (Aim 1).

Although the original analysis plan was to examine the data using a directive content analysis based on Pender's Health Promotion Model (HPM), it became evident that such an approach would sub optimize the data by force-fitting the information into pre-existing groupings. To overcome this limitation, conventional content analysis was used to arrange the data into data-driven themes, and then compared to the HPM.

After the preliminary coding was completed, patterns were noted in the data. These included the importance of understanding one's background ("My History"), one's self ("Who I Am") and how personal preferences ("What Works for Me") influenced health behaviors ("My Health Habits"). Both military culture (regulations, mandatory training, etc.) and society (family members, access to restaurants, etc.) were also identified as having an influence on these broad concepts. This finding was developed into a preliminary "tree" model using these themes.

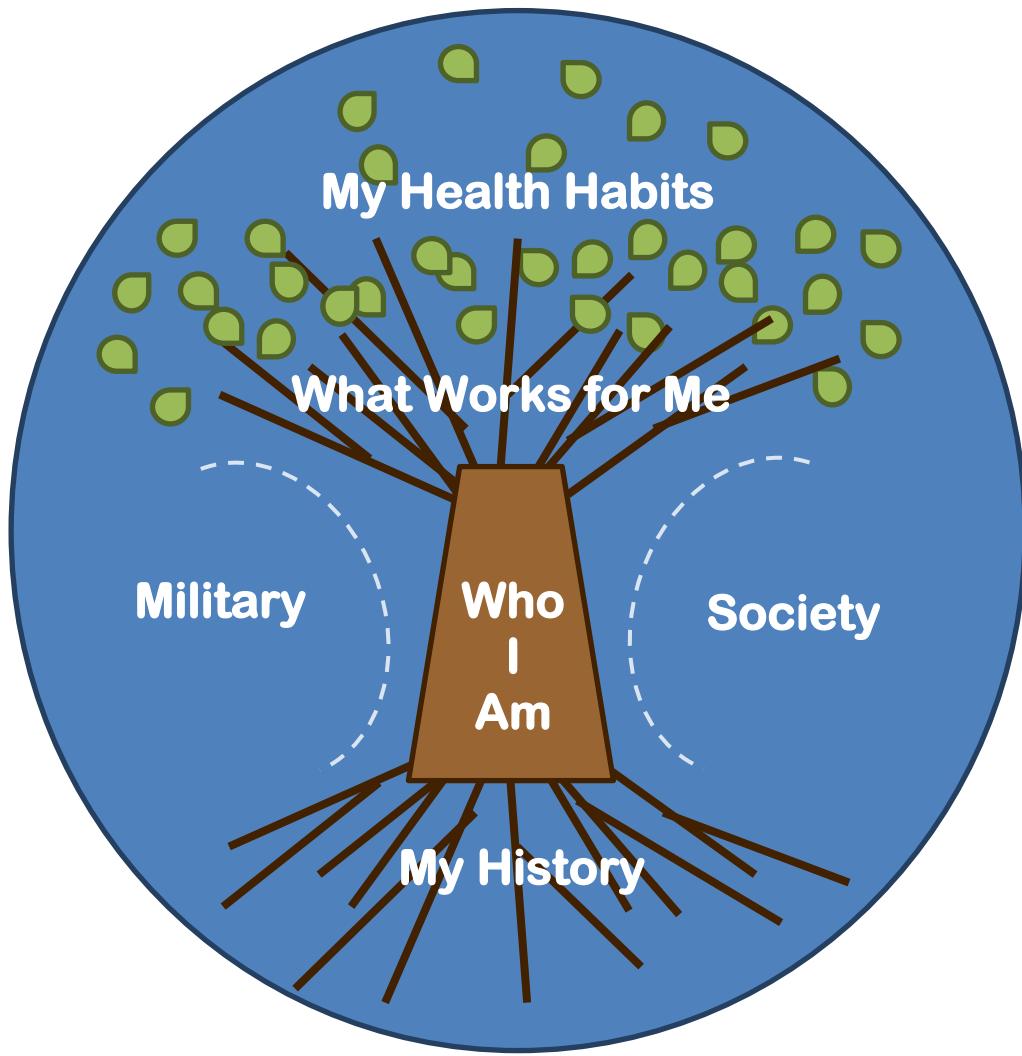


Figure 1. Model of preliminary themes from initial data analysis efforts.

However, after team members were able to review and discuss the preliminary themes as depicted in the "tree" model, it was determined that this model did not fully incorporate all of the factors described by the participants that influenced health behaviors. Additionally, there was also a sense that there was an underlying belief about the definition of "health" that needed to be captured. Following this discussion, the team focused on establishing the definition of health used by the participants, and focusing on the specific factors that influenced health.

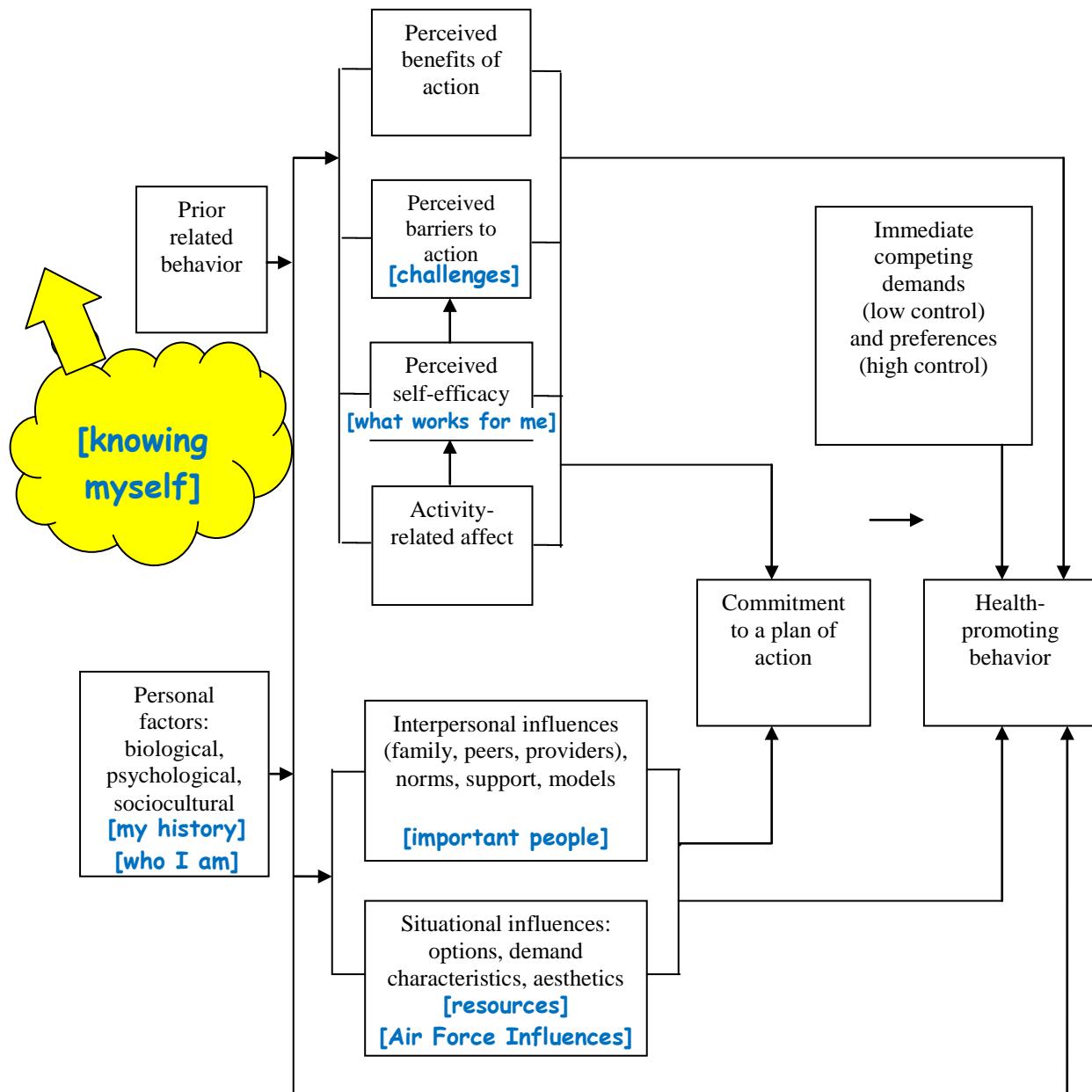
Health was defined as comprising several attributes that included the presence of exercise, proper eating, sufficient sleep, and a spiritual connection, as well as the absence of smoking, excessive stress, alcohol consumption, and caffeine ingestion. Universally, participants felt that the Air Force physical fitness test was neither a measure of health, nor a contributor to health. Rather, the fitness test was viewed as simply a requirement to keep one's job.

There were three major factors identified by participants that contributed to health:

1. What it takes to be healthy included:
  - a. Resources,
  - b. Overcoming challenges,
  - c. Important people,
  - d. Healthy living
2. Knowing oneself included:
  - a. Personal history,
  - b. Knowledge of "who I am",
  - c. Understanding of "what works for me" (such as individual or group exercise),
3. Air Force Influences included:
  - a. Leadership,
  - b. Deployments/permanent change of station (PCS)/temporary duty (TDY),
  - c. Standards/fitness test
  - d. Mandatory/group physical training.

Juxtaposing the findings with the HPM illustrated that active duty Air Force members do not talk about health in the way addressed in the HPM. Consequently, the themes did not fit well with the more "cerebral" concepts used in the HPM as illustrated in Figure 2. Themes, however, did fit the HPM "personal factors." Although the personal factors influenced participants' approach to health, these factors did not necessarily influence their commitment to a plan of action. Participants also addressed the "prior related behavior" concept of the HPM, but much less often. As anticipated in the original proposal, Air Force culture and military-unique factors were partially reflected in Pender's "situational influences" concept, but the process of actually integrating these policies and standards into daily life were not fully captured by the HPM.

Most important was the discovery of a key attribute of healthy behavior that is absent from the HPM: the importance of "knowing myself." This self-knowledge is key to success in developing healthy habits and achieving a healthy lifestyle. Knowing myself encompassed all the data that reflected how people needed self-understanding to develop a lifestyle that would support being healthy. For instance, recognizing (and embracing) personal preferences with respect to what time of the day to schedule an exercise program, choosing which foods to eat, or how to implement a new lifestyle change.



**Figure 2.** Revised Pender Health Promotion Model from Tomey & Alligood (2006, p. 458) with study themes.

Aim 2: Design a lifestyle behavioral intervention that takes into consideration predisposing, reinforcing, and challenging factors (Aim 1) in order to improve cardiovascular health outcomes of active duty members in the USAF.

The results of the qualitative analysis were used to design an intervention (Aim 2), which was reviewed and supported by a focus group consisting of five participants. It was clear, both from the interviews and the focus group, that personalizing the intervention and incorporating self-exploration were essential.

Below are key elements of the intervention, based on the information provided in the interviews, and as reinforced by the focus group:

Key elements of the intervention:

- Review basic “tenets” of healthy living WITH a personal application.
  - o Diet/healthy eating
  - o Exercise
  - o Sleep
  - o Stress management
  - o Spirituality
- Be able to set personal goals and track progress (did I achieve them?)
- Incorporate metrics (weight, body mass index, blood pressure, cholesterol, others)
  - o Track/trend progress
  - o Compare to others (competition is important, yet too much competition is a disincentive for some)
  - o Provide non-monetary incentives or rewards for achieving goals, or demonstrating progress
- Tailored follow-up
  - o Participants decide how much interface they wanted during the program
  - o OK to have contact at beginning/end, but not too much

Overall suggestions from the focus group:

- Include a baseline intervention AND ongoing refresher training
- Delivery format options are important (classroom vs. online vs. mobile app)
- Use existing programs (such as “My Fitness Pal”)
  - o Use AF Branding
  - o Group Lifestyle Program
- Integrate with existing training platforms
  - o Consider Computer Based Training (CBT)
  - o Advanced Distributed Learning Service (Air Force training website)
- Incorporate Air Force-specific terminology
  - o Comprehensive Airman Fitness (four pillars: Fitness, Physical, Emotional, Spiritual)
- Make it fun and interactive

Although not an essential element of the intervention, it became evident in the interviews and then corroborated in the focus group that health was considered separate from the Air Force fitness program, which was considered separate from the annual preventive health assessment

that is a medical requirement each year for Air Force Members. In particular, fitness and medical requirements were not seen as applicable to day-to-day life, but only once-a-year (or twice-a-year) requirements that related to keeping one's job. Health, in contrast, was seen as a very personal activity that not only built on knowing one's self, but also related to very personal choices made on a regular basis. Because of this finding, it is important to demonstrate the link between individual health choices, and the fitness and medical requirements in a way that supports all three, rather than making them either irrelevant, or competing priorities.

Another important element of the intervention is the need for it to be transportable from one Air Force base to another. Factors affecting the transportability include the independence of commanders to implement various programs as well as what specific fitness programs and facilities are available at each installation. With diminishing resources, it is also important to be able to provide this intervention through a centrally-funded and centrally-managed program that could continue to exist outside of an individual unit's budgetary or personnel decisions. This ensures the intervention could be implemented in a widespread, long-term fashion, regardless of where the military member is assigned.

### **Relationship of current findings to previous findings:**

Based on a review of previous studies, it is evident that lifestyle modification is still an important component to preventing and controlling cardiovascular disease (Heald et al., 2012). Different efforts have been made to improve cardiovascular risks, including the use of community health workers (Krantz, Coronel, Whitley, Dale, Yost & Estacio, 2013), tailored lifestyle support (Cochrane et al., 2012), community outreach (Nguyen et al., 2012), and low-dose (one day per week) physical activity (Hamer & Stamatakis, 2012). All of these interventions, except the use of community health workers, have demonstrated some positive impact on cardiovascular risks (Krantz et al., 2013; Cochrane et al., 2012; Nguyen et al., 2012; Hamer & Stamatakis, 2012). In the military population, cardiovascular risks have modestly improved through physical activity interventions in multiple countries, including Iran (Naghii, Almadadi & Zarchi, 2011), Finland (Cederberg et al., 2011), and among National Guard members in the United States (Talbot, Metter, Morrell, Frick, Weinstein & Fleg, 2011). A review of the literature underscores the need for tailored interventions to address all facets of lifestyle modification, and the need to better understand the unique barriers and facilitators of the military population.

There were two prior interventions highlighted in the original proposal to prevent cardiovascular disease in the military community (Marshall, Walizer, & Vernalis, 2009; Nelson, Robbins, & Thornton, 2006). However, both required an extensive time commitment from participants, and also required a significant amount of resources to provide the intervention. Unfortunately, neither of these two interventions expanded to additional sites and neither intervention is currently being offered. Incorporating the recommended intervention developed as part of this study into existing training platforms and making it available online would be one way to consolidate resources, and ensure the intervention is sustainable.

Although the HPM has been widely used to develop lifestyle modification programs (Tomey & Alligood, 2006), it is interesting that these concepts were not clearly reflected in the analysis of

interview data. Although some “personal factors” matched well with the HPM, they did not necessarily influence health promotion behaviors in this sample of active duty military personnel. This is consistent with a recent meta-analysis of social cognitive theories (including the HPM), which found that only 33% of the variance in health behaviors could be explained by a theoretical model (Plotnikoff, Costigan, Karunamuni & Lubans, 2013). A study of health promotion behaviors among military women (and funded by the TriService Nursing Research Program) used a survey grounded on the HPM theoretical model (Agazio & Buckley, 2010). This study found that self-efficacy and interpersonal influences were the most important factors in determining health behaviors, while personal factors were not found to contribute significantly to health promotion activities, with only 33% of the total variance explained by the HPM factors (Agazio & Buckley, 2010).

Based on this prior evidence and the findings of this study, the HPM may be helpful to conceptualize some elements of health promotion, but may not adequately address all of the factors that influence health behaviors. As found in this study, a significant element that must be incorporated into any lifestyle modification program, particularly among Active Duty Air Force Members, is the importance of understanding one’s self and how to fully integrate recommended health behaviors into one’s daily life.

### **Effect of problems or obstacles on the results:**

There were two significant obstacles encountered during the course of this study. The most obvious obstacle was an unexpected deployment by the PI mid-way through the projected timeline. Although all interviews were completed prior to the deployment, and coding of the transcripts continued during the deployment, the focus group was not held until several months after the interviews had been finished. This significantly limited the availability of participants to take part in the focus group. Although the size of the focus group was adequate ( $n = 5$ ) and demographically diverse, the characteristics of this group were potentially different than the larger group, as their assignment may have been more stable.

As mentioned previously, the other obstacle that was not anticipated was that we were unable to recruit younger officers (under the age of 35) with hypertension. We were, however, able to recruit enlisted members under the age of 35 who had hypertension, and officers 35 years of age and older with hypertension. Although Travis Air Force Base is a large military base with more than 10,000 active duty members, a query of the population health dataset revealed that there were only a total of three officers under the age of 35 with a diagnosis of hypertension. Because of this, and consistent with the IRB protocol, the team decided not to attempt to identify these individuals, but rather enrolled three additional participants to meet the total sample size of 24. These three individuals were younger enlisted members without hypertension (which reflects a majority of the active duty population) with an attempt to include both male and female participants to capture any potential gender differences. Although it is interesting to note that the prevalence of hypertension among younger officers is extremely low, there is a potential that this unique population would have an important viewpoint on the factors that influence health behaviors.

**Limitations:**

Perhaps the greatest limitation was not being able to construct a true prototype of the intervention. Key elements were identified, yet they were not packaged in any fashion that might be used or tested to determine feasibility. Another potential limitation of this study is that the findings represent one Air Force base. We do not know if the views of the participants represent the views and experiences of Air Force members from other bases. This concern is partially mitigated by the fact that an inclusion criterion for this study was that participants were required to have been assigned to another base. In this way, the transferability of the findings was enhanced. Rigor of the findings was also enhanced by the carefully constructed purposive sampling plan that assured attaining perspectives from participants representing a variety of backgrounds (with and without hypertension, males/females, age groups, officers/enlisted).

**Conclusion:**

Findings from this study provide an important perspective into understanding the factors that influence health behaviors of active duty Air Force members. The findings also illustrate a unique perspective on the definition of health among active duty Air Force members. The proposed intervention, although preliminary, could provide a useful framework for military nurses and leaders as they identify appropriate approaches to reduce cardiovascular risk behaviors. There is certainly a need for continued research to test and evaluate lifestyle modification programs, particularly among military members with military-unique requirements and cultural factors. However, in addition to incorporating these military-specific requirements, the findings of this study emphasize the need to help these individuals understand the critical factors of their own personal history, a knowledge of “who I am”, and an understanding of “what works for me”. Although the Air Force active duty force is strong and capable, it is also evident that these warfighters are fully human with rich and diverse personal backgrounds that clearly influence health behaviors. As military nurses, we are uniquely qualified to integrate all of these factors in a way that maintains a fit and ready force.

### **Significance of Study or Project Results to Military Nursing**

Several findings from this study are significant to military nursing clinical practice, leadership, education, and policy.

Findings from this study provide important information to clinical nurses to understand what motivates people to stay healthy (rather than just passing a fitness test), the importance of finding ways to personalize existing interventions, and the need to incorporate military-specific challenges into any recommendations made about lifestyle changes.

The findings of this study also provide information to healthcare leaders. First, they provide insight on the impact of leadership decisions and policies that may or may not contribute to the health of the unit members. Secondly, the findings also provide an important perspective about the challenge active duty members have balancing military-specific requirements with personal health habits. Understanding this will assist leaders to carefully implement and institute guidance that can support both military standards as well as personal efforts to improve or maintain cardiovascular health.

Because the elements identified for the proposed intervention are geared toward health education, educators need to understand how to assist people to achieve and sustain a good state of health. As a result of this study, it would be important for educators to incorporate military-specific challenges into lifestyle modification programs that are offered, particularly the need to help participants plan for transition points where lifestyle is upset and sustaining good habits may be difficult or impossible. These transition points include moving to a new base, deployments, and temporary duty. They would also need to find ways to help people feel comfortable with new exercises and acknowledge military standards—both to use them as a motivator, but also to recognize limitations of the standards.

Lastly, findings from this study provide information that can inform policies. There is a need to take into account aspects of an individual, and a need to evaluate whether current approaches to fitness succeed in keeping people healthy. Although this study does not provide clear answers on how best to modify existing policies, it underscores the need to reconsider the long-term effects of existing policies in light of the identified factors that influence health behaviors.

**Changes in Clinical Practice, Leadership, Management, Education, Policy, and/or Military Doctrine that Resulted from Study or Project**

NONE TO DATE

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**Summary of Dissemination**

Type of Dissemination	Citation	Date and Source of Approval for Public Release
Publications	None	
Publications in Press	None	
Published Abstracts	None	
Podium Presentations	Hatzfeld, J., Jennings, B., Nelson, M. & Waters, C. "Understanding How to Improve the Modifiable Cardiovascular Risks of Active Duty Air Force Members"  Abstract accepted for Podium Presentation at the Military Special Interest Group, American Academy of Ambulatory Care Nursing (AAACN), April, 2013. Las Vegas Nevada.  <i>(conference was cancelled due to government travel restrictions)</i>	N/A
Poster Presentations	None	
Media Reports	None	
Other	None	

**Reportable Outcomes**

<b>Reportable Outcome</b>	<b>Detailed Description</b>
Applied for Patent	None
Issued a Patent	None
Developed a cell line	None
Developed a tissue or serum repository	None
Developed a data registry	None

### Recruitment and Retention Table

<b>Recruitment and Retention Aspect</b>	<b>Number</b>
Subjects Projected in Grant Application	24
Subjects Available <i>(note: number of active duty members assigned to Travis AFB)</i>	10,000
Subjects Contacted or Reached by Approved Recruitment Method <i>(note: contacted via e-mail by unit fitness monitors &amp; other groups)</i>	>500
Subjects Screened	37
Subjects Ineligible	2
Subjects Refused	2
Human Subjects Consented	24
Subjects Who Withdraw	0
Subjects Who Completed Study	24
Subjects With Complete Data	24
Subjects with Incomplete Data	0

Note: a total of 37 were screened; however, 9 were considered “duplicates” (a prior enrolled subject had the same characteristics), 2 were ineligible, and 2 were eligible for the study but declined to participate (listed as “refused” in the table above).

### **Demographic Characteristics of the Sample**

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**Characteristic**

Age Category, n (%)

21-34 years	12 (50%)
35 years and older	12 (50%)

Women, n (%)

10 (42%)

## Race

White, n (%)	7 (29%)
Black, n (%)	7 (29%)
Other, n (%)	10 (42%)

## Rank Category

Enlisted, n (%)	14 (58%)
Officer, n (%)	10 (42%)

## Military Service or Civilian

Air Force, n (%)	24 (100%)
Army, n (%)	0
Marine, n (%)	0
Navy, n (%)	0
Civilian, n (%)	0

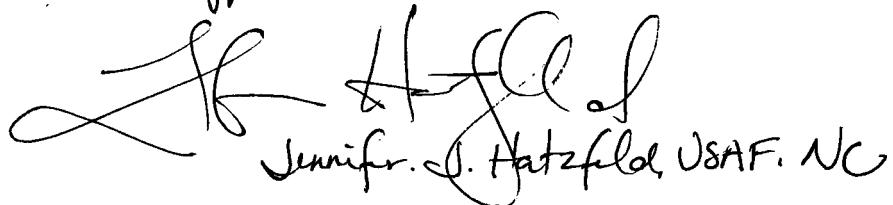
## Service Component

Active Duty, n (%)	24 (100%)
Reserve, n (%)	0
National Guard, n (%)	0
Retired Military, n (%)	0
Prior Military but not Retired, n (%)	0
Military Dependent, n (%)	0
Civilian, n (%)	0

**The Geneva Foundation**  
**Summary Budget Comparison - Unposted Transactions Included In Report**  
**1188 - 1188-Understanding & Improving Modifiable CV Risks**  
**From 9/1/2010 Through 6/30/2013**

Account Code	Total Budget - PROJECT BUDGETS	CURRENT PERIOD ACTUAL	TOTAL EXPENSED TO DATE	Total Budget Variance - PROJECT BUDGETS
CONS	23,507.87	23,507.87	23,507.87	0.00
INDR	19,490.60	19,121.96	19,121.96	368.64
OTHR	402.50	402.50	402.50	0.00
PERS	67,980.86	66,130.71	66,130.71	1,850.15
SUPP	3,711.62	3,711.62	3,711.62	0.00
TRAV	2,336.55	2,337.55	2,337.55	(1.00)
Report Difference	(117,430.00)	(115,212.21)	(115,212.21)	2,217.79

Reviewed and approved.



Jennifer D. Hatzfeld, USAF, NC